

Claims

1. A method of recycling glass fibre material, the method comprising the steps of:

- 5 – providing glass fibre material extracted from a composite material containing glass fibre embedded in a matrix material, the glass fibre material being provided in a first form,
- mechanically treating the glass fibre material in the first form into glass fibre material in a second form, the glass fibres in the second form having a mean fibre length smaller than the mean fibre length of the glass fibres in the first
10 form, and
- further treating the glass fibre material in the second form so as to obtain glass fibre material in a third form, the glass fibre material in the third form being suitable for insulation material, i.e. the third form contain glass fibres in a form where the fibres are in a random, or apparently random, network embracing
15 air-cavities.

2. A method according to claim 1, wherein the glass fibres in the first form is having a mean fibre length so that the first form is a non-powder form.

20 3. A method according to any of the claims 1-2, wherein the glass fibre material in the first form is extracted by means of pyrolysis or gasification of the matrix material, thereby releasing the glass fibre from the embedding matrix.

25 4. A method according to any of the claims 1-2, wherein the glass fibre material in the first form is extracted by means of incineration or oxygen combustion of the matrix material, thereby releasing the glass fibre from the embedding matrix.

30 5. A method according to any of the claims 1-2, wherein the glass fibre material in the first form is extracted by means of chemically dissolving of the matrix material, thereby releasing the glass fibre from the embedding matrix.

6. A method according to any of the preceding claims, wherein the composite material is a waste material.

35 7. A method according to any of the preceding claims, wherein an amount of mineral wool is added to the glass fibre in the first form.

8. A method according to any of the preceding claims, wherein the mechanical treatment comprising the steps of passing the glass fibre material from an inlet through a chamber comprising a rotor and a plurality of stators and from the chamber through a mesh into an outlet.

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9. A method according to claim 8, wherein the mesh comprises mesh openings in the size range 1-10 mm, such as 2-8 mm, such as 3-5 mm.

10. A method according to claim 8, wherein the mesh comprises mesh openings in the size range 20-50 mm, such as 25-45 mm, such as 30-40 mm, such as approximately 35 mm.

11. A method according to any of the preceding claims, wherein the glass fibre material in the second form comprises glass fibres having a mean fibre length substantially in the range of 0.1-5 mm, such as 0.5-5 mm, such as between 1-4 mm, such as between 2-3 mm.

12. A method according to any of the claims 1-10, wherein the glass fibre material in the second form comprises glass fibres having a mean fibre length substantially in the range of 10-40 mm, such as 15-35 mm, such as 20-30 mm, such as approximately 25 mm.

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13. A method according to any of the preceding claims, wherein the glass fibre material in the first form comprises glass fibres having a mean fibre diameter substantially in the range of 10-25 micrometer, such as in the range 15-18 micrometer.

14. A method according to any of the preceding claims, wherein the further treatment comprising providing the glass fibre in the form of glass wool suitable for use as an insulation material.

15. A method according to claim 11, wherein the glass fibre material in the second form is further treated into substantially pellet-shaped objects comprising glass fibre and optionally a binding material for maintaining the shape of the pellet-shaped objects.

16. A method according to claim 15, wherein the substantially pellet-shaped objects are in the size range of 3-15 mm, such as 4-13 mm, such as 5-11 mm, such as 8-10 mm.

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17. A method according to any of the claims 1-14, wherein the glass fibre material in the second form is further treated into the form of insulation panels, insulation mats or a roll of insulation material.

18. A method according to claim 17, wherein the insulation panel comprises at least one curved surface.

19. A method according to any of the preceding claims, wherein the glass fibre material in the first step of claim 1 is extracted by heating the composite material in a substantially inactive atmosphere in a closed furnace chamber to a process temperature between 450-650 °C during a process period, by means of which substantially all the matrix material is converted into gas, which is carried off while the glass fibres remain substantially intact and may, after the process period, be withdrawn from the furnace chamber.

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20. A method according to any of the preceding claims, wherein the matrix material comprises a thermosetting resin, such as an epoxy material, a polyester resin, a vinyl ester resin and/or a phenoplast resin and/or a thermoplastic material.

15 21. A method according to any of the preceding claims, wherein the material in the third form is suitable for heat insulation, cold insulation and/or sound insulation.

22. An apparatus comprising an inlet, a treatment chamber and an outlet, the apparatus being adapted for performing the method according to any of the claims 1-21.

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22. Insulation material being fabricated according to any of the claims 1-21.

23. Use of glass fibre material extracted from a composite material containing glass fibre embedded in a matrix material for insulation material.